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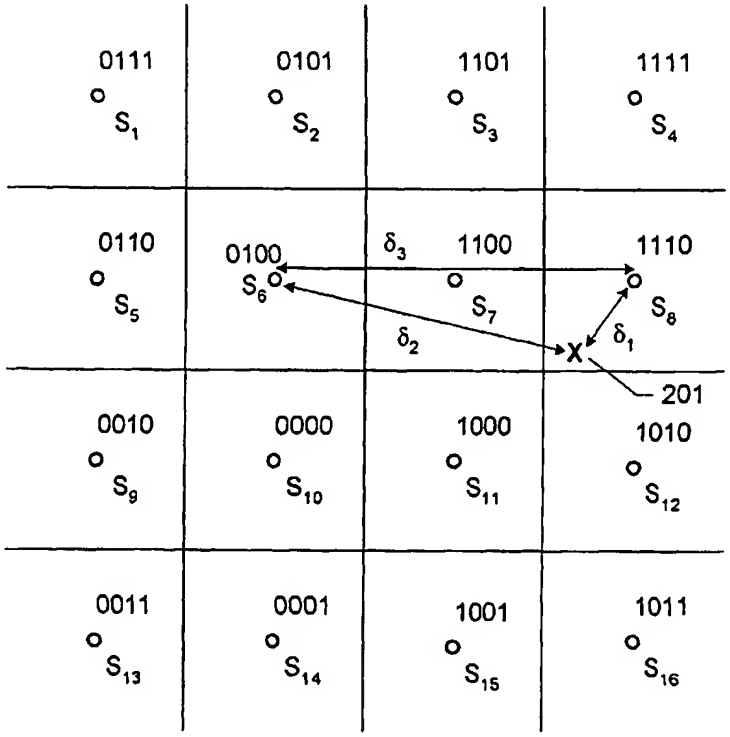
(54) Title: SOFT VALUE CALCULATION FOR MULTILEVEL SIGNALS



(57) Abstract: A sub-optimal method is disclosed for calculating the reliability values (soft values) for the bits of a multilevel signal. The log-likelihood values are approximated using only the dominant terms, so called max-log approximation, that is for each bit position only the two closest signal symbols of opposite bit value (S_8,S_6) are considered in the sum. The used modulation scheme is 16-QAM together with Gray-labelling. Two versions of approximation are proposed: one version consists of using the two distances between the received value and the two closest symbols of opposite bit value (δ_1, δ_2). In order to simplify and speed up the calculation, the second version consists of using the distance between the two closest symbols (δ_3) to approximate the distance between the second closest symbol and the received value. Furthermore, precalculated results are stored in look-up tables to speed up the calculation. Possible applications are especially bit interleaved coded modulation (BICM) together with soft-input decoding. It is also of interest for TCM and BCM schemes.

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